

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented): An emitting light source apparatus of a reflection-type for use in an optical encoder which applies light to a reflecting scale having an optical grating formed along an axis of measurement and which receives the reflected light from the scale with a light-receiving element to output a displacement signal, said apparatus comprising:

a leadframe disposed opposite to said scale;

a light-emitting chip mounted on said leadframe, said light-emitting chip having a light-emitting surface substantially orthogonal to an optical grating surface of said scale and in a direction of the optical grating; and

a molded transparent resin sealing both the light-emitting chip and said leadframe,

wherein said transparent resin includes a first optical element provided at an end face of said molded transparent resin which faces the light-emitting surface of said light-emitting chip, and a second optical element provided at the other end face of said molded transparent resin which is remote from the light-emitting surface of said light-emitting chip, said first optical element reflecting the light from said light-emitting chip substantially parallel to the optical grating surface and in a direction

orthogonal to the direction of the optical grating, said second optical element reflecting the parallel light from said first optical element and focusing the reflected light toward the optical grating and illuminating the optical grating over a specified area in the direction of the optical grating on the optical grating as the focused light is converged toward the optical grating.

2. (Previously Presented): The emitting light source apparatus according to claim 1, wherein said second optical element reflects the parallel light from said first optical element and focuses the reflected light toward the optical grating and illuminates the optical grating over an area wider than a length of said light-receiving element in the direction of the optical grating as said focused light is converged toward the optical grating.

3. (Currently Amended): ~~The emitting light source apparatus according to claim 1, wherein~~ An emitting light source apparatus of a reflection-type for use in an optical encoder which applies light to a reflecting scale having an optical grating formed along an axis of measurement and which receives the reflected light from the scale with a light-receiving element to output a displacement signal, said apparatus comprising:

a leadframe disposed opposite to said scale;

a light-emitting chip mounted on said leadframe, said light-emitting chip having a light-emitting surface substantially orthogonal to an optical grating surface of said scale and in a direction of the optical grating; and

a molded transparent resin sealing both the light-emitting chip and said

leadframe.

wherein said transparent resin includes a first optical element provided at an end face of said molded transparent resin which faces the light-emitting surface of said light-emitting chip, and a second optical element provided at the other end face of said molded transparent resin which is remote from the light-emitting surface of said light-emitting chip, said first optical element reflecting the light from said light-emitting chip substantially parallel to the optical grating surface and in a direction orthogonal to the direction of the optical grating, said second optical element
~~includes~~including a planoconvex cylindrical lens consisting of a flat surface on a side of the lens on which the parallel light from said first optical element is incident and a convex spherical surface on the other side of the lens, said second optical element reflecting the parallel light from said first optical element and focusing the reflected light toward the optical grating and illuminating the optical grating over a specified area in the direction of the optical grating on the optical grating as the focused light is converged toward the optical grating.

4. (Original): The emitting light source apparatus according to claim 1, wherein said first optical element includes a spherical or aspheric lens having the focus at said light-emitting chip.

5. (Original): The emitting light source apparatus according to claim 1, further comprising:

a reflective film formed on an outside surface of said first or second optical element.

6. (Original): The emitting light source apparatus according to claim 1, wherein said light-receiving element is formed integrally to the said emitting light source apparatus.

7. (Previously Presented): The emitting light source apparatus according to claim 1, wherein said light-emitting chip is positioned above said light-receiving element

8. (Previously Presented): The emitting light source apparatus according to claim 1, wherein said second optical element is positioned above said light-receiving element.

9. (Previously Presented): An emitting light source apparatus of a reflection-type for use in an optical encoder which applies light to a reflecting scale having an optical grating formed along an axis of measurement and which receives the reflected light from the scale with a light-receiving element to output a displacement signal, said apparatus comprising:

a leadframe disposed opposite to said scale;

a light-emitting chip mounted on said leadframe, said light-emitting chip having a light-emitting surface substantially orthogonal to an optical grating surface of said scale and in a direction of the optical grating; and

a molded transparent resin sealing both the light-emitting chip and said leadframe,

wherein said transparent resin includes a first optical element provided at an end face of said molded transparent resin which faces the light-emitting surface of said light-emitting chip, and a second optical element provided at the other end face of said molded transparent resin which is remote from the light-emitting surface of said light-emitting chip, said first optical element reflecting the light from said light-emitting chip substantially parallel to the optical grating surface and in a direction orthogonal to the direction of the optical grating, said second optical element, which includes a planoconvex cylindrical lens consisting of a flat surface on a side of the lens on which the parallel light from said first optical element is incident and a convex spherical surface on the other side of the lens, wherein incident parallel light from said first optical element passes through said flat surface and is reflected by said convex spherical surface back through said planoconvex cylindrical lens flat surface toward the optical grating and illuminates the optical grating over a specified area in the direction of the optical grating on the optical grating as the reflected parallel light is converged toward the optical grating.

10. (Previously Presented): The emitting light source apparatus according to claim 9, wherein said second optical element reflects the parallel light from said first optical element and focuses the reflected light toward the optical grating and illuminates the optical grating over an area wider than a length of said light-receiving element in the direction of the optical grating as said reflected parallel light is converged toward the optical grating.

11. (Previously Presented): The emitting light source apparatus according to

claim 9, wherein said first optical element includes a spherical or aspheric lens having the focus at said light-emitting chip.

12. (Previously Presented): The emitting light source apparatus according to claim 9, further comprising:

a reflective film formed on an outside surface of said first or second optical element.

13. (Previously Presented): The emitting light source apparatus according to claim 9, wherein said light-receiving element is formed integrally to the said emitting light source apparatus.

14. (Previously Presented): The emitting light source apparatus according to claim 9, wherein said light-emitting chip is positioned above said light-receiving element

15. (Previously Presented): The emitting light source apparatus according to claim 9, wherein said second optical element is positioned above said light-receiving element.